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10/805,792

03/22/2004

Eric Gustave Lundquist

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ROHM AND HAAS COMPANY
PATENT DEPARTMENT
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399

EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

01/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/805,792

Applicant(s)

LUNDQUIST, ERIC GUSTAVE

Examiner

Ives Wu

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 21-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 21-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

(1). In view of the Appeal Brief filed on 12/26/2007, PROSECUTION IS HEREBY REOPENED. A new Ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

SUPERVISORY PATENT EXAMINER
DUANE SMITH
1-10-08

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(2). **Claims 1, 3-4, 22-23, 25** are rejected under 35 U.S.C. 102(b) as being anticipated by Goldstein et al, "Sulfone Formation during the Sulfonation of Crosslinked Polystyrene", Ion Exchange and Membrane, 1972, Vol. 1, pp.63-66.

As to A catalyst comprising at least one sulfone cross-linked ion exchange resin having improved resistance to deformation under pressure, the catalyst further comprising polymerized monomer units of (a) from 0.1 to 10 wt% of one or more polyvinylaromatic monomers and (b) from 90 to 99.9 wt% of one or more monounsaturated vinylaromatic monomers; wherein the catalyst contains 0.1 to 1.0 millimole sulfone groups per gram dry catalyst in **independent claim**

1, Goldstein et al "Sulfone Formation during the Sulfonation of Crosslinked Polystyrene" disclose sulfonation of crosslinked polystyrene (a) with chlorosulfonic acid. **1 gram of 170-250 M diameter of polystyrene beads, which were crosslinked with 8% DVB (Divinyl Benzene),** were swollen in 20 ml dichloromethane, a mixture of 10 ml chlorosulfonic acid and 20 ml nitromethane was then added. The exchange capacity of the resin thus obtained by potentiometric titration of the resin beads while the sulfur content was determined gravimetrically after fusion with sodium peroxide in an electrically fired Parr bomb (Experimental). The experimental results obtained confirm the formation of sulfone bridges when sulfonating with chlorosulfonic acid (last page), as shown in the Table I, the **% sulfone crosslinks** are listed for various conditions of reaction, which reads on the limitations of instant claim. Since the disclosure of Goldstein et al meets the requirements of the present claims both in terms of the types of materials added and their contents, it is reasonable to presume that the product of Goldstein et al would fulfill the same **utility of catalyst** as presently claimed in light of its chemical similarities. the burden is shifted to applicant to established that the product of the present claims is not the same as or obvious as that set forth by the reference. Moreover, the product of Goldstein et al would have improved resistance to deformation under pressure in view of substantially identical structure.

As to catalyst resin beads to be prepared from a jetted, suspension polymerized polystyrene/divinylbenzene copolymer in **claim 3**, because it is product-by-process limitations, which although prepared in a different manner, appeared to be the same as the claimed product. *In re Thorpe*, 227 USPQ 964 (CAFC 1985).

As to be in the reactor used for producing at least one bisphenol and is present in an amount from about 1 to 40 wt%, based on total weight of reactants, which comprises one or more phenols and one or more aldehydes or one or more ketones in **claim 4**, because the product disclosed by Goldstein et al is substantially identical to the catalyst product in applicant's claim 4, it will be useful in catalyzing the condensation reaction between phenol and acetone, yielding bisphenol-A as well, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

As to catalyst catalyzing the condensation reaction between phenol and acetone, yielding bisphenol-A in **claim 22**, because the product disclosed by Goldstein et al is substantially identical to the catalyst product in applicant's claim 1, it will be useful in catalyzing the condensation reaction between phenol and acetone, yielding bisphenol-A as well, the intended use must result in a manipulative difference as compared to the prior art. *See In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

As to one or more polyvinylaromatic monomers selection in **claim 23**, Goldstein et al disclose the DVB.

As to one or more monounsaturated vinylaromatic monomers selection in **claim 25**, Goldstein et al disclose polystyrene beads.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(3). **Claims 2, 24 and 26-33** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Goldstein et al "Sulfone Formation during

the Sulfonation of Crosslinked Polystyrene", Ion Exchange and Membranes, 1972, Vol. 1, pp. 63-66.

As to the catalyst in the form of spherical beads having an acid capacity of 4.0 to 6.0 millimole sulfonic acid groups per gram dry catalyst in **claim 2**, in view of the substantially identical product disclosed by applicant and by Goldstein et al, it is Examiner's position to believe that the product of Goldstein et al would inherently possess the acid capacity as claimed. Since USPTO does not have proper means for the measurement, the burden now is shifted to applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

As to capable of catalyzing the formation of at least one bisphenol upon contacting phenols and aldehyde or ketones in **claim 2**, because the product disclosed by Goldstein et al is substantially identical to the catalyst product in applicant's claim 1, it will be useful in catalyzing the condensation reaction between phenol and acetone, yielding bisphenol-A as well, the intended use must result in a manipulative difference as compared to the prior art. *See In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

As to catalyst comprising 0.6 mmol of aromatic rings having tow sulfonic acid groups per gram of dry catalyst and the catalyst comprising 0.2 mmol of sulfone bridging groups per gram of dry catalyst in **claim 24**, in view of the substantially identical product disclosed by applicant and by Goldstein et al, it is Examiner's position to believe that the product of Goldstein et al would inherently possess 0.6 mmol of aromatic rings and 0,2 mmol of sulfone bridging groups per gram of dry catalyst as claimed. Since USPTO does not have proper means for the measurement, the burden now is shifted to applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

(5). As to the limitation of **independent claim 26**, the disclosure of Goldstein et al is incorporated herein by reference, the most subject matters of copolymer component having between 1.0 and 6.0 wt% of divinylbenzene cross-linking, at least one sulfone cross-linked ion exchange rein having improved resistance to deformation under pressure has been recited in the applicant's claims 1, 2, 4 and 24 in a narrower scope, and has been discussed therein.

As to the catalyst having acid capacity of greater than 4.0 mmol/g and having 0.1 to 1.0 mmol/g of sulfone bridging groups per gram dry catalyst in the **independent claim 26**, in view of the substantially identical catalyst compositions and slightly different process of sulfonation between Lundquist and by applicant, it is the examiner's position to believe that the catalyst of Lundquist would inherently possess acid capacity of greater than 4.0 mmol/g and having 0.1 to 1.0 mmol/g of sulfone bridging groups per gram dry catalyst. Since USPTO does not have proper means to conduct the experiments and measure the properties, the burden now is shifted to applicant to **prove** otherwise. *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

As to the limitations of **dependent claim 27**, the disclosure of Goldstein et al is incorporated herein by reference, the most subject matters of 1 – 4 wt% of divinylbenzene crosslinking, having acid capacity of greater than 5.1 mmol/g in the applicant's claim 26 has been recited in the applicant's claim 1 and 26, and has been discussed therein.

As to the limitation of **dependent claim 28**, the disclosure of Goldstein et al is incorporated herein by reference, the most subject matters of spherical beads catalyst prepared from jetted, suspension polymerized polystyrene/divinylbenzene copolymer in applicant's claim 27 has been recited in the applicant's claim 3, and has been discussed therein.

As to the limitations of **dependent claims 29-33**, the disclosure of Goldstein et al is incorporated herein by reference, the most subject matters has been recited in applicant's claims 4 and 21-24, and has been discussed therein.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(4). **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein et al "Sulfone Formation during the Sulfonation of Crosslinked Polystyrene" Ion Exchange and Membranes, 1972, Vol. 1, pp. 63-66, in view of Lundquist (US05233096A).

As to 1 to 35 wt% of sulfonic acid groups containing an ionically attached thiol promoter in claim 21, Goldstein et al **do not teach** the use of an ionically attached thiol promoter in 1 to 35 wt% as claimed.

However, Lundquist (US05233096A) **teaches**, optionally in the presence of from about 1 to 40 wt% of a mercaptan reaction promoter, preferably ethanolthiol, aminoethane-thiol or dimethyl-thiazolidine (Col. 4, line 34-41).

The advantage of using a thiol compounds is to promote the chemical reaction.

Therefore, it would have been obvious at time of the invention to include the thiol promoter of Lundquist in the reaction of Goldstein et al in order to obtain the advantage cited above.

Response to Arguments

Applicant's arguments, see Argument Section of Appeal Brief, filed on 12/26/2007, with respect to the rejection(s) of claim(s) 1 under 102/103 in view of Lundquist (US05233096A) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Goldstein et al "Sulfone Formation during the Sulfonation of Crosslinked Polystyrene", Ion Exchange and Membranes, 1972, Vol. 1, pp. 63-66.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Examiner: Ives Wu

Art Unit: 1797

Date: January 9, 2008

DUANE SMITH
PRIMARY EXAMINER


1-10-08